Learning from Post-Project Reviews

Topic 24 The value of failure

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Abstract

Companies that write and analyse PPRs often want to learn something that they can use in new product development. The two most important ways of learning are learning from your own experiences and learning from others experiences. There are three ways of experiencing knowledge from experience: by doing it yourself, storytelling and by observing others.

When considering learning there are two sorts of information. Know that, based on explicit facts, observations and propositions and know how, which is more practical and tacit.

There are a couple of factors that make learning easier. These are absorptive capacity, understanding information instead of just memorising it, and that it takes time to learn something. It is important to take all of these factors into account when considering organizational learning.

There are two ways of dealing with mistakes in previous projects. These are single-loop learning and double-loop learning. But just as everything else in life, learning also has a couple of barriers. There are four kinds of barriers. A psychological barrier, there are team-based shortcomings, epistemological barriers and managerial constraints.

Up until now there are two known models for conducting PPRs. The first one is a five-step model. Next to that there is a six-step model that is partially the same as the five-step model. In this paper a new model, put together with the information of the other two models, does emerge. This is also a six-step model, that will consider the most important steps of the two previously known models.

But not only the process is important, also the quality of a PPR is vital. A good-quality PPR is useful for its users. This can all be achieved by total quality management, not every factor of it can be used but there are certainly similarities. The factors that need to be considered are communication, strategic quality management, teamwork, operational quality planning, measurement systems and corporate culture.

There are a couple of aspects that can improve the PPR-project. These are the the PPR should be run as a mini project, the meeting should be led by an independent facilitator and everyone
should be prepared for all the meetings. Next to that it is important to invite key stakeholders and take care of a good timing and the right environment.

A right learning environment is an enabling environment that has working conditions that promote learning. This is the opposite of a constraining environment which hinders learning. Most companies lie somewhere in between these environments in practice. There are a couple of important things when considering a learning environment. Two of these are reducing fear and improving communication.

The environment during meetings also has to be safe to get the team members to speak freely. This can be achieved by focusing on your communication method. The atmosphere in the meeting environment has to be factual and serious to make everybody feel safe. This can be achieved through an independent facilitator.

Next to considering the environment inside the firm, also the external environment is important. It is vital to work with partners for sharing knowledge and information. This information sharing should also occur between different divisions inside the firm.
Table of contents

Chapter 1 Introduction ............................................................................................................... 6
  Introduction ............................................................................................................................ 6
  Research Questions................................................................................................................. 7
  Conceptual model ................................................................................................................... 7
  Academic relevance ................................................................................................................ 8
  Managerial relevance .............................................................................................................. 8
  Thesis structure ....................................................................................................................... 8

Chapter 2 Learning from PPRs to improve new product development ................................. 9
  Post-Project Reviews .............................................................................................................. 9
  Learning .................................................................................................................................. 9
  Influential factors on learning ............................................................................................... 10
  Organisational learning ........................................................................................................ 11
  Types of organisational learning ......................................................................................... 11
  Pitfalls ................................................................................................................................... 12
  Summary ............................................................................................................................... 13

Chapter 3 Process quality and learning .................................................................................. 14
  Five step process ................................................................................................................... 14
  Six step process .................................................................................................................... 15
  New six step model ............................................................................................................... 15
Chapter 1 Introduction

Introduction
To learn from past successes and failures is important, because of the high costs of new product development. To make this learning more structured firms came up with so-called post-project reviews (PPRs). To make these PPRs, members of the project teams come together and reflect on what went well and what went wrong to improve future project performance (Julian, 2008). After this discussion the information has to be written down, analysed and shared within the company. This is called the PPR process.

Nowadays a lot of companies use post project reviews (PPR) to review what they did right and what went wrong in a certain project. These reviews can then be used to improve new product development. This is the complete process of bringing a new product or service to the market. After the review most companies just store the outcomes in a database and never look at them again. They see the PPRs as an end in itself and do not use the lessons learnt for improvement. But according to Hlavacek, Maxwell and Williams (2009) PPRs are only valuable if they are analysed and distributed throughout the company. To make sure that PPRs really reflect the past project it is important to make sure that all information is taken into account and that the information is correct. In a safe learning environment, people are willing to discuss more details. A safe learning environment must be factual, serious, and everybody has to feel safe to say what they want (Hlavacek et al., 2009).

Besides not using the reviews they also often lack criteria and guidelines to conduct them (Choudhary, Oluikpe, Hardiing and Carrilo, 2009). By using a set guideline for conducting reviews companies make sure that they won’t forget important criteria needed for a good review. There is already some research done about PPRs and how they should be used, but there are no papers yet that focus on how to improve the value of PPRs for the firms. So the question for this paper is: To what extent do the PPR process and the learning environment influence learning and, subsequently new product development?
Research Questions

To evaluate past projects some companies write reports about the process and the final results (Koners and Goffin, 2007). These reviews are of great importance for future improvements and innovation (Julian, 2008). In these changing times it is essential to be better than your competitors and not to make the same (often expensive) mistakes again. But just writing PPRs is not the most difficult part, if firms really want to learn something it is important to analyse the outcomes. To improve knowledge and improve results it is necessary that PPRs are not just written but also used to learn. This leads to the first research question guiding the current study: What can companies learn from PPRs to improve the effectiveness of new product development?

These reports have to be written, analysed and shared to really improve the learning from PPRs. Of course the quality of these processes has to be good to get the most out of the PPRs. This leads to the second research question dealt with in this paper: What is the influence of the process quality of post process reviews on learning from PPRs?

Another important variable in learning is the learning environment (Hlavacek et al. 2009). The learning environment has to create certain conditions for project team members to be honest and admit mistakes. This leads to the third research question covered in this study: What is the influence of the learning environment on learning from PPRs?

Conceptual model

To structure this study the following model is created. In the following chapters each of the relationships between the variables will be discussed.
Academic relevance

Extant literature already discussed PPRs, but there is only scattered information about getting the most out of the reviews. There are some papers that include a section about improving the relevance of PPRs, but there has never been a study that puts it all together. There already is information about how to write the post project reviews (Baird et al., 1999; Busby, 1999). Furthermore there are also papers available about why it is important to conduct PPRs (Koners et al., 2007) and how they should be distributed across the organisation (Ayas, 1996). So in this paper the focus will be primarily on how to improve the value of post project reviews.

Managerial relevance

For companies it is important to learn from past successes and failures as fast and effective as possible (Baird et al, 1999). There are a lot of companies that do write PPRs, but then just put them in a database and never look at them again (Koners and Goffin, 2007). To optimise the learning it is important that the reviews are analysed and used in the best way. If firms spend a lot of time just writing the reviews and then don’t use them properly, it’s just a waste of time and money. From a managerial point of view, studying ways to improve values of PPRs is highly relevant.

Thesis structure

The outline of this thesis is as follows:

Chapter 2 will be about what companies can learn from post project reviews and how PPRs improve learning from past failures and successes.

Chapter 3 will discuss the practise of writing, analysing and sharing the PPRs. The focal points will be finding the best structure for PPRs, how the analysis could best be conducted and how the new information can be best distributed in the company to maximise the learning effects.

In chapter 4 the moderating effect of the learning environment on learning will be this discussed.

Chapter 5 will give a conclusion about the earlier discussed topics. This chapter will also contain a discussion and recommendations for further research.
Chapter 2 Learning from PPRs to improve new product development

This chapter will start with an introduction to Post-Project Reviews. After the introduction learning and more specifically organisational learning will be considered. And the chapter concludes with the difficult sides of learning from PPRs.

Post-Project Reviews

According to Gavin (1993) learning from experience and learning from the experiences of others are the two most important items for becoming a learning organisation. By repeating tasks in different projects, team members get better at their jobs and performance will be improved. This learning is often exchangeable to other projects. By just learning from previous projects, only the team members of the previous project benefit from the gained knowledge. To really improve organisational learning it is important for a company to make sure that the newly achieved knowledge is transferred to the rest of the company (Ayas, 1996). The company also needs to make sure that every project contributes to the development of the processes and make sure that there is continuous improvement (Prahalad and Hamel, 1990). All of this can be done by conducting Post-Project reviews (PPRs). A PPR is a concluding official review of a project that looks at all the lessons that may be learned during the project and gets them ready for future projects (Wideman, 1992). By conducting a PPR, a company looks back at a project to learn from the successes and failures of that project to avoid mistakes in the future (Choudhary et al., 2009). The main objective of PPRs is to smooth the progress of continuous learning throughout the organization. Learning efficiently defends and develops a firm’s competitive advantage (Wheelwright and Clark, 1992). A lot of businesses already conduct PPRs, but they just write them and never look at them again. By doing it this way they just spend a lot of money on writing them, however without analysing them no learning will be achieved.

Learning

Now first let’s have a look at how learning can be achieved in general. Knowledge is the product of a learning experience (Chartered Institute of Personnel and Development, 2002). There is a distinction between “know that” and “know how” (Kogut and Zander, 1992). ”Know that” is based on explicit facts, observations, and propositions absorbed from the
public domain through a process of individual cognition. There are 2 forms of “know that”: embrained (individual) and encoded (collective). “Know how” is practical and tacit. There are 2 forms of “know how”: embodied (individually generated) and embedded (learned). The tacit knowledge is produced by solving practical problems and can best be learned through experience. The easiest way of learning is through learning from failures or experience. This is the most natural form of learning for individuals. Learning from experience can be achieved in three ways: by experiencing it yourself, by storytelling and dialogue, and by the observation of others (CIPD, 2002).

**Influential factors on learning**

There are a couple of factors that influence learning. By knowing these influencing factors, businesses can improve learning in their company and by this save money through eliminating costs of ineffective learning. The first factor is the degree of mastery of the original subject. Without knowing anything about the subject yet, transfer of new information will be very difficult or even impossible (Klahr and Carver, 1988). Cohen and Levinthal (1990) call this absorptive capacity. There are a couple of ways to improve this absorptive capacity. Cohen and Levinthal say that research shows that firms that conduct their own research and development are better able to use external information. This is a condition that is already met for most firms that write PPRs. The firms that are considered in this research all conduct their own R&D because they develop new products. Next to R&D also manufacturing and advanced technical training improve employees absorptive capacity. So it is important that workers are already skilled in a certain subject before they learn new skills that follow up on that subject. This previous knowledge will increase the effectiveness of the learning and makes workers remember the new information better and longer. The absorptive capacity of an organization depends on the absorptive capacities of the individual members (Cohen and Levinthal, 1990). However, it is not just the sum of the individual absorptive capacities. It depends on the transfer of knowledge from outside the company and between and within different divisions of a company.

The next important factor is that understanding things is better than just memorising things. If you understand what you have learned, you will be able to remember this more clearly and use the newly gained knowledge better and more effective (Bransford et al., 1983).
Understanding things depends also on previous knowledge, this is called absorptive capacity, so the first two important factors are very much related to one another. The third factor is that it takes time to learn something. Often the amount of time it takes to learn is proportional to the amount of material and the degree of difficulty. So if people need to learn a lot or very difficult things, they need time to process the information learned (Singley and Anderson, 1989). To improve organisational learning it is important that the workers feel that they have time to learn something and that there isn’t any time pressure on them. The last important factor is motivation. People are often more motivated when they believe something is useful (McCombs, 1996). So let them know what the use of their task is and that they are important to the company. If they feel that what they do matters, they are willing to put more effort in and learn more.

**Organisational learning**

Next it is good to discuss organisational learning through PPRs. At first it was thought that organisational learning could just occur by detecting error and then just continue (Argyris, 1977). Later Crossan and Guatto (1995) discovered that for organisational learning to work, it is important to create, acquire and transfer knowledge across the firm. With this new knowledge the old behaviour has to be modified to improve the processes. Organisational learning is critical as it is a condition for improvements in R&D (Reger and von Wichert-Nick, 1997). There are three levels of learning in an organisation: individual, team and group learning, and organisational learning. With conducting and analysing PPRs the focus is on the relation between team and organisational learning.

**Types of organisational learning**

According to Argyris and Schön (1978) there are two sorts of learning in the process of team and organisational learning: single-loop learning and double-loop learning. Single-loop learning focusses on detecting and correcting failures, without questioning or changing the system as a whole. It’s mostly about just correcting the mistakes that are made. With double-loop learning the mistakes are being analysed and the whole system is reviewed and corrected where necessary. When discussing PPRs the double-loop learning system is considered. But as discussed before it is important to not just focus on formal learning but also include
informal and tacit knowledge. But since this is informal information it is hard to systemise and replicate this information (Kogut and Zander, 1992). This kind of knowledge is often shared through informal group meetings, but it is important that this information is documented (von Zedtwitz, 2002). PPRs are a way of systematically using double-loop learning by making the information of a project available for the whole company.

**Pitfalls**

Learning from PPRs is not as easy as it seems, so now the focus is on why it is so difficult to learn from PPRs. There are four barriers in conducting and learning from PPRs (Von Zedtwitz 2003).

The first one is a psychological barrier. This barrier consist of two parts that are very normal to human beings. At first it is difficult for humans to objectively reflect on their own actions and the consequences. A lot of people think that past actions and experiences do not apply if the circumstances change. So for them it is not necessary to reflect on their past. It is also hard for people to adapt to these new ways of learning, because they have always been taught that learning and reflection are not central in a project and they don’t see that as an important aspect (Ayas, 1996). The next part of the psychological barrier is the inability of a human memory to remember everything correctly. Most people only remember the good things vividly and try to forget about the unsuccessful parts. The unsuccessful thing are not completely forgotten but if no one brings them up, they won’t be discussed voluntarily. Repressing bad memories is a natural way to simplify life, but it can cause valuable information for future projects to be forgotten (von Zedtwitz, 2002).

The next barrier is team-based shortcomings. Team members often don’t want to blame themselves or others for problems that arrised during the project. Instead of telling the truth they for example put the blame on unclear goals or ignorant clients. They are afraid that if they admit failures, they make themselves look bad and by this ruin career opportunities. Another team-based shortcoming is a lack of good internal communication. A lack of communication can have different causes. People can often communicate better with some people than others. Other causes for poor communication can be distance and, different technical, functional, or cultural backgrounds.
Another type of barriers are epistemological barriers. It is difficult to formulate general conclusions from single events. It is also difficult to share tacit knowledge. Due to absorptive capacity people often know more than they can tell (Durrance, 1998). It is easy to share numbers and that kind of outcomes of a project, but experiences are a lot harder to share across the organisation.

The last barrier is managerial constraints. In companies there often is a lack of time to conduct PPRs and learn from past projects. Most managers find it a waste of time to look into ‘old’ problems. In Kotnour’s (1999) questionnaire managers state that they find it important to learn from past projects but feel that they don’t have enough time to really look into them. Another form of managerial constraints is bureaucracy. PPRs often have to follow a lot of guidelines and are often imposed by the management. This reduces the enthusiasm to write the PPR and because of this PPRs often just follow the guidelines and the learning function will be neglected (von Zedtwitz, 2002).

**Summary**

To learn from past projects it is important to make sure that the gained knowledge is transferred to all employees and not just to the projects team members. Even though the most natural way of learning is through experience, if a PPR is formulated in the right way employees can learn from that as well. When writing a PPR it is good to be aware of the factors that influence learning, to make sure that optimal learning effects can be achieved. Schön has found that the best way for organisational learning to be successful is by using double-loop learning. But there are also a couple of pitfalls with learning. These are psychological barriers, team-based shortcomings, epistemological barriers, and managerial constraints. However, as long as firms are aware of the pitfalls they can still use PPRs in the most optimal way to learn from past projects. And if this learning can be optimized, it will be easier to improve new product development. When improving learning, it is easier to use the newly gained information when developing new products.
Chapter 3 Process quality and learning

In this chapter the process of writing PPRs will be discussed. After that the importance of quality and Total Quality Management will be discussed. A couple of factors to improve the quality of a PPR and organizational learning can be found at the end of this chapter.

Five step process

To make sure the PPR is useful it is be good to have a defined process. This process must have a clear link to future projects. Collier et al. (1996) describe a five-step process for conducting PPRs. Step one is to conduct a project survey. This survey can help define the scope of the rest of the PPR, can show the major issues, and can be used to see if there has been any improvement. A survey is also an easy way to collect large volumes of information, which is especially useful with large projects.

The second step is to collect objective information. This is often hard data, like information about costs, time and quality. The best way of collecting this data is by looking at it at the beginning, in the middle and at the end of a project. This way a good estimate can be achieved.

Step 3 is a debriefing meeting. In this meeting, team member get the opportunity to give direct feedback about the project. It is important that this happens in a safe and structured environment, to make people speak as freely as possible. In this meeting the project leaders can also try to get more information about some positive and negative issues that they are interested in.

Step 4 is project history day. Collier et al. (1996) think of this as the most important step in the PPR process. In this stage the participants focus on the root causes of the problems that were discovered. It is at this stage that the basis is set for learning and new knowledge.

In step 5 the results will be published. Here the project leaders summarise the findings and publish the results in an open letter to the project teams. This letter should consist of four parts:
- The project description: a brief overview of what the project was about and why it was
- The good parts: this is an overview of the positive findings during the project

- The bad parts: the three worst factors that made reaching the goals the hardest

- The ugly ones: here an outline for improvement is made. Most of the times one key issue of the bad parts is selected and the possible improvement for the next project is outlined here.

**Six step process**

Another process to properly conduct PPRs is the one that Baird et al. (1999) describe in their study. They use a six steps for this. The first step is to define the intent of the project that will be reviewed. After identifying the intent the team members have to recall what exactly happened during the project. They should include the good and the bad actions in this part.

The third step find out what is learned during this project. The best way to do this is to compare the intent to the final results. In step 4 the team members have to think about what can be done with this new information. There has to be thought of short-term, mid-term and long-term actions to improve new projects of new product development. After the actions have been written down, it is important that they are implemented as well. This will be done in step 5. For step 6 it is important to spread the gained information throughout the company.

**New six step model**

For this paper there is a new model formed. This is made out of a combination of the best steps mentioned in the processes above. For this model the first step is to define the intent of the project. When studying past projects it is important to first go back to where and why it all started. From that point a conduct survey can be conducted, this is step two. After that it is important to have a debriefing meeting and collect objective information (step three). Step four is to make a shortterm, midterm, and longterm action plan. After all the information is collected it is good to think of what can be done with it. Step five is used to implement the actions that are defined in step four. At last to make sure that everyone in the company can learn for a past project it is important to spread the information throughout the company.
Quality of the PPR through Total Quality Management

Not only the process of writing a PPR is important. Besides using a predefined process the PPR also has to be of good quality to make it useful. Quality is here defined as getting the most out of a PPR. A PPR is of good quality if it is useful for its users. A good method of providing and keeping quality is Total Quality Management (TQM). TQM emphasizes on continuous improvement, reducing rework, long-range thinking, increased involvement and team-based thinking, process redesign and many other things (Powell, 1995).

Not every aspect of TQM is applicable on PPRs, because TQM also focusses on customer relationship management, when considering quality. When considering PPRs quality is only about factors inside the firm. Black and Porter (1996) show that in TQM there are 10 critical factors to make it work. Six of these factors are also important when considering PPRs and these are communication about improvements, strategic quality management, teamwork, operational quality planning, measurement systems and a corporate quality culture. As said before it is important to have good communication within a company (Cohen et al., 1990). This will increase the absorptive capacity of a firm and thereby can increase the results of organizational learning. Quality planning is of course important when considering quality management. Companies should know what they are doing and the objectives should be clear to every employee or team member. Besides this teamwork and corporate culture are important. With good teamwork and a good corporate culture quality can be maximized. To check whether the quality is still high it is good to have a set measurement system. This will increase the continuity of the quality level. And last the planning has to be good. When writing PPRs timing is important. When a PPR is conducted too late, the team members will not remember what happened during the project. But it should neither be rushed. When things are rushed, important outcomes can be ignored which will reduce the quality. All these factors need to be considered when writing a good quality PPR.

Six guidelines for writing high-quality PPRs

Von Zedtwitz (2003) also showed six factors that should be considered when writing a PPR. The first one is that a PPR should be run as a mini project on itself. It is important to set a goal before starting to write a PPR. Get clear what you would like to do with the analysis once its finished. This will increase the usefulness of the PPR. Secondly it is important to let an
experienced and independent facilitator run the meeting that will be used to write a PPR. This facilitator can add neutrality, sometimes an outside facilitator is even better. This is because it allows the team members to be more open and honest.

The third factor states that it is important that the review team is prepared for the meeting. This way the most information about the project can be gained and the team members have more time to think so less information will be forgotten. Factor four states that the meeting should be held in the right environment and at the right time. So environment and timing are also good to consider. A good option could be to hold the meeting offside. The other location can reduce interruptions that could occur while being at your workplace.

Next to that it is vital to invite key stakeholders of current and selected future projects. They can bring some valuable input and need to have the information that is gained in the meeting. At last it is important to produce a summary of the meeting right after it. This will prevent the team members from forgetting what was said at the meeting and will reduce the loss of information.

**Summary**

There is not yet one perfect process for conducting PPRs, but they can be of high quality if companies keep a couple of „ground rules” in mind. The first „rules” that need to be considered are communication, strategic quality management, teamwork, operational quality planning, measurement and a good corporate culture. Besides these TQM factors there are six other „rules” to be considered. These rules include writing down a clear goal, use an experienced facilitator, make sure that the review team is prepared for the meeting, use the right environment, invite key stakeholders to the meeting and provide a summary after the meeting.

When optimizing the quality of PPRs, the level of organizational learning will be optimized at the same time. A stated earlier some of the factors that are used to improve the quality of PPRs also improve the quality of organizational learning.
Chapter 4 The influence of the learning environment on learning from PPRs

At first the learning environment will be discussed. After that there will be some factors that can create an effective learning environment. The last part of this chapter will be about the environment during PPR meetings.

Learning environment

The learning environment can facilitate or constrain learning inside the workplace. According to Ellström, Ekholm and Ellström (2007) there are two types of learning environments: an enabling and a constraining environment. An enabling learning environment has working conditions that promote learning and a constraining environment contains working conditions that hinder learning. These two sorts of learning environments are two theoretical extremes and most companies lie somewhere in between them in practice.

Getting an effective learning environment

The first important thing when considering a learning environment is communication. To transfer information it is vital that there is a good communication system within the firm (Cohen et al., 1990). The whole firm has to be considered when talking about communication. The company has to make sure that there is not only communication within a unit of the firm but also between the different units. To make this work it is best if there are individuals that stand in between the different units and that can oversee the whole company. These individuals can judge where certain information can be best used inside the firm (Cohen et al. 1990). The individuals that stand between the different units should be careful about giving too much information to other department. This overload of information can make learning too difficult.

Another factor that needs to be considered is fear for change. When processes are changing it can occur that people get afraid if these changes (Schein, 1993). When creating a safe learning environment it is essential to make sure that everyone in this environment feels safe. Don’t just change situations in the organization, but make sure that every employee understands these changes as well. This can reduce the fear of change and improves the safety of the learning environment.
How information can be best transferred

To make sure that each employee that gets the new information really listens and learns something, you have to be aware of your communication method. When focusing on your communication method you can generate interest. In this way a positive and receptive environment can be created (Barker and Neailey, 1999).

The environment during the PPR meeting

The environment when discussing the past project should also be safe. This to make sure that every team member feels free to speak and that most of the needed information can be discovered. A safe „meeting environment” can be achieved by making sure that the atmosphere is factual and serious (Hlavacek et al., 2009). Don’t act to confrontal, because this may scare some people and this will keep them from saying anything. The best way to make sure that the meeting environment is safe is to use a facilitator during the meeting. This is also already discussed in chapter three. The facilitator should be experienced in leading these kind of meeting, to maintain a relaxed and safe environment (Von Zedwitz, 2003).

Cooperation between firms

A firm’s absorptive capacity depends not only on the individuals in the firm, but also on the external environment (Cohen and Levinthal, 1990). To make this really work it is important to cooperate with other firms. Not only information retrieved within the firm itself, but also information from other firms is important in the learning process. For cooperation to work companies should have a “gatekeeper” to filter all incoming information. This gatekeeper can provide the employees with all the necessary outside information without them having to worry about an information overload.

Learning from partner firms is easier when there exists an open relationship between the firms (Kale, Singh and Perlmutter, 2000). To achieve such an open relationship it is important for firms to trust each other. Without trust, both firms fear opportunistic behavior of the other firm. This fear can prevent firms from sharing the gained knowledge. To build up trust firms need a long term relationship with each other (Kogut and Zander, 1992). Next to trust it is good for firms to understand where the relevant information resides in its partner company.
Next to that it is important to find a balance between internal and external information sources. Excessive dominance by either external or internal information will be dysfunctional (Cohen and Levinthal, 1990).

**Cross-functional teams**

Inside a firm the subdivisions should all be linked together. They can have some of the same problems and can thus also exchange solutions and knowledge with each other (Cohen and Levinthal, 1990). The speed of new product development is influenced by the degree of linking between subdivisions. In Japan some companies even rotate personnel through different divisions to create the ultimate exchange of knowledge (Cohen and Levinthal, 1990).

**Summary**

A good and safe learning environment can only be created if everyone is completely focused. It will not happen without spending time creating a good learning environment. Communication within and outside the firm is vital to make sure that all available information is spread throughout the firm. Besides that it is important to make sure that there are no people left that are afraid of change. Make sure every need for change is explained so that there is nothing to be afraid of. And at last a safe environment during the PPR meeting is the most important factor. This is the first step in the review process and everything that fails in this part already will influence the rest of the PPR process. Not only knowledge within the firm is important. It is vital to cooperate with external firms to improve the knowledge gained and maximize learning. Also within the firms workers of different divisions should communicate with each other to share all the knowledge they have gained.
Chapter 5 Conclusion, discussion and future recommendations

Conclusion

The following question will be answered in this conclusion: *To what extent do the PPR process and the learning environment influence learning and, subsequently new product development?*

As seen in chapter two learning depends on a lot of different factors. When learning from PPR’s there are a couple of these factors that need to be considered. The value of the information and knowledge that is learned is one of the most important factors. To make sure this is of high quality it is important to have a good and high quality PPR outcome. The information gained from a PPR is depends on the quality of the PPR process. The best way to ensure this quality is to follow a model when conducting a PPR. Then after the value of such a PPR is good a firm needs to look at the environment in which the learning takes place. An open and encouraging learning makes learning easier. This can then improve the learning from PPRs.

When taking all this newly gained information into account at the next new product project, the same mistakes will not be made again. Without making the same mistakes, it is not excluded that there will not be any mistakes, but at least the firm has learned from the past mistakes. This will improve new product development.

Discussion

When considering the learning environment there are some researchers that are in favor of sharing information with partner firms, but also some that are against this. The discussion is whether it is selfdestructing or not to share information with a partner in this everchanging world. Companies never know whether their openness will be just used or abused. In this paper the focus was on the researchers that were in favor of sharing information. This was chosen because nowadays information is often already widely available and to really stand out you have to know more than the rest. What is known forever is that two know more than one, so if you can share this information it is often good to do so. Of course firms have to be careful
who to share the information with. But if it is done the right way it can deliver a lot of benefits.

Another disagreement between different researchers is the amount of information that should be shared. How open should companies be when sharing information with the partner firms. Are they going to tell all their secrets because they feel like the other firm is doing so as well or are they not sure whether their partner is being completely honest. This has been left out in this paper, to make sure that the last chapter was not going out of the determined scope.

**Recommendations**

When further researching PPRs it might be helpful to conduct an empirical study to find out what the best PPR process is and how to gain the most knowledge out of a project review. Because this study is only a literature review the information found here is limited to combining already known facts and from this creating a new angle on an older subject.

When considering an empirical study make sure to include not only businesses that already use PPRs but try to compare them with companies that try to learn from projects in different ways. This has not been studied yet and can provide some new insights. What is most important is trying to find a single model for conducting PPRs to make it easier for companies to conduct them. The new six-step model provided in this paper is not yet empirically tested.

For use of this paper in practice it is also important to look at the influence of personnel on the PPR process. In this paper only standards have been given but these are not tested in real-life situations. It is a given that also the quality of the personnel can influence the quality of the PPR process, because they are the ones to conduct the Post-Project Review.
References


